REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of April 2, 2007 is respectfully requested.

By this Amendment, claim 1 has been amended and claim 7 has been cancelled. Thus, claims 1-6 and 10-12 are currently pending in the application. No new matter has been added by these amendments.

On page 2 of the Office Action, the Examiner rejected claims 1 and 10 under 35 U.S.C. § 102(b) as being anticipated by McMaster (US 4,470,858). In addition, on pages 3-4 of the Office Action, the Examiner rejected claims 1-7 under 35 U.S.C. § 103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of van den Akker (US 6,425,969). Further, on page 5 of the Office Action, the Examiner rejected claims 1-7 and 10-12 under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Tsujimoto et al. (US 7,063,768). For the reasons discussed below, it is respectfully submitted that the amended claims are clearly patentable over the prior art of record.

The discussion of the invention provided below makes reference to the figures of the present application. However, these references are made only for the Examiner's benefit, and are not intended to limit the claims.

The present invention is directed to a method of manufacturing a circuit forming board. As shown in Fig.1, a sheet 1 extends in a first direction 102, and the sheet is dipped in varnish 2 while being transferred in a second direction 101 which is parallel to the first direction 102 in order to form prepreg sheet 3. As shown in Fig. 3, films 4 are stuck onto both surfaces of prepreg sheet 3 while being transferred in a third direction 104 which is orthogonal to the first direction 102, with the films 4 being arranged to be peeled off from the prepreg sheet 3.

Amended independent claim 1 recites a method of manufacturing a circuit forming board, comprising transferring a first sheet, which extends in a first direction, in a second direction such that the first direction of the first sheet is parallel to the second direction. The method of claim 1 also comprises sticking films onto both surfaces of the first sheet while transferring the first sheet

in a third direction orthogonal to the first direction of the first sheet, with the films being arranged to be peeled off from the first sheet.

McMaster discloses a lamination process which, as shown in Figs. 24 and 25, includes applying adhesive to surfaces of glass plates 300, 302, and a sheet of substrate 310 is applied to the adhesive on one of the glass plates 300, 302. The glass plates 300, 302 are then pivoted on their side edges so as to be oriented vertically, and pressed together such that the substrate 310 is sandwiched between the glass plates 300, 302. The glass plates 300, 302 and substrate 310 are then moved through rollers 320, 322 to increase the spread of adhesive between the substrate 310 and the glass plates 300, 302, and are then moved under ultraviolet lamps 330 for curing the adhesive.

However, McMaster does not disclose *the films being arranged to be peeled off from the first sheet*, as required by amended independent claim 1. McMaster discloses that the adhesive polymerizes when the glass plates 300, 302 and substrate 310 are passed under the ultraviolet lamps so as to secure the glass plates 300, 302 to the substrate 310, and does not disclose that the glass plates are arranged to be peeled off from the substrate.

In addition, McMaster also does not disclose transferring a first sheet, which extends in a first direction, in a second direction such that the first direction of the first sheet is parallel to the second direction, and sticking films onto both surfaces of the first sheet while transferring the first sheet in a third direction orthogonal to the first direction, as required by independent claim 1. Rather, Fig. 25 of McMaster discloses that the glass plates 300, 302 are moved in a horizontal direction which is parallel to the three parallel lines of the adhesive pattern 306 on the glass plates 300, 302, but does not disclose that the glass plates are moved in a third direction orthogonal to the direction of the three parallel lines of the adhesive pattern 306. Column 16, lines 45-49 of McMaster states that "the only difference from the schematic of the process steps illustrated in Fig. 24 from those in Fig. 25 is that the combination is fed vertically through the rollers and between the ultraviolet lamps." Thus, on page 6 of the Office Action, the Examiner notes that Fig. 24 discloses the glass plates being transferred in a third direction orthogonal to the first direction. However, it is noted that in Fig. 24, the glass plates 300, 302 are oriented such

that the three parallel lines of the adhesive pattern 306 (*i.e.*, the first direction in Fig. 25) are perpendicular to the horizontal direction. Therefore, Fig. 24 does not disclose that the first direction of the first sheet is parallel to the second direction, because the three parallel lines of the adhesive pattern are perpendicular to the horizontal direction. Therefore, it is respectfully submitted that McMaster does not disclose all the limitations of independent claim 1.

The Applicants' Admitted Prior Art (AAPA), as shown in Figs. 6 and 7 of the present application, discloses a glass cloth 11 having a side extending in a first direction 202 and being moved in a direction 201 parallel to the first direction 202. Films 14 are then applied to the sheet as the sheet is moved in the direction 201 parallel to the first direction 202. Thus, as noted by the Examiner, the AAPA does not disclose the films being applied to the sheet while the sheet is transferred in a third direction orthogonal to the first direction, as required by independent claim 1.

The van den Akker reference discloses a method for the production of a transverse web which, as shown in Figs. 3 and 12, includes a longitudinal fiber web 1 being cut into web parts 9 by a cutting blade 18 as the fiber web 1 is moved along a conveyor belt in a longitudinal direction of the fibers. The web parts 9a, 9b are then moved in a direction transverse to the longitudinal direction, so that longitudinal sides 14, 15 of the web parts 9a, 9b can be attached to one another so as to form a transverse fiber web 10. The transverse fiber web 10 is then joined with a longitudinal fiber layer 20 to form a cross ply 23.

Therefore, the Examiner asserts that one of ordinary skill in the art would have had a reason to combine the method of the AAPA with the teachings of van den Akker to arrive at the claimed invention. In particular, the Examiner notes that van den Akker discloses, in column 6, lines 10-14, that the web parts 9 are attached to each other in the transverse direction in order to form a laminate structure having a uniform thickness. Thus, on page 3 of the Office Action, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to modify the AAPA by utilizing the transferring of the "first sheet in the third direction orthogonal to the first direction of the first sheet as taught by van den Akker to obtain a circuit board having uniform thickness."

However, it is noted that van den Akker discloses that the web parts are moved in the transverse direction so that longitudinal sides of adjacent web parts can be connected to each other. Further, van den Akker discloses that the longitudinal fiber web 1, prior to being cut into web parts 9, can be made such that the fiber material 8 or stabilization layer 7 projects from an end of the fiber web 1, as shown in Fig. 4. Thus, as explained in column 6, lines 5-12, by using a fiber web 1 with the projecting ends as shown in Fig. 4, the web parts can be connected at complementary longitudinal ends so as to form a transverse fiber web which does not have an increased thickness where the web parts are joined, as shown in Fig. 7.

Based on this disclosure, van den Akker does not provide a reason for modifying the AAPA so as to arrive at the claimed invention because, as discussed above, van den Akker discloses that the web parts are moved in a transverse direction (orthogonal to the longitudinal direction) in order to enable complementary longitudinal sides of separate web parts to be connected together. In other words, van den Akker discloses that the uniform thickness is attained due to the complementary connection of longitudinal edges of the separate parts, and not due to the movement of the web parts in the transverse direction. The AAPA, however, relates to manufacturing a circuit forming board, which does not include attaching complementary longitudinal sides of separate parts. Therefore, one of ordinary skill in the art would not have transferred the sheet of the AAPA in a third direction orthogonal to the first direction based on the disclosure of van den Akker in order to attain a uniform thickness, because van den Akker does not disclose that a uniform thickness can be attained without complementary longitudinal sides of separate parts.

In this regard, it is noted that on page 6 of the Office Action, the Examiner asserts that van den Akker discloses that the transferring of the first sheet 9 in the third direction orthogonal to the first direction while attaching the first sheet to the longitudinal sheet 20 is to produce a laminated structure having "uniform thickness (see Fig. 7) and strength (see Col. 7, lines 53-57)."

However, as stated above, van den Akker discloses that the transverse fiber web 10 has a uniform thickness due to the connection of complementary longitudinal ends of the web parts 9. Further, column 7, lines 49-53 of van den Akker discloses that the transverse fiber web 10 is

formed before being joined to the longitudinal sheet 20 as shown in Fig. 12, and does not disclose that the cross ply 23 (*i.e.*, the combination of the transverse fiber web 10 and the longitudinal sheet 20) has a uniform thickness. In other words, van den Akker only discloses that a portion of the cross ply 23 has a uniform thickness (*i.e.*, the transverse fiber web 10 portion), but does not disclose that the transferring of the transverse fiber web 10 in the third direction while attaching the longitudinal fiber web 20 to the transverse fiber web 10 produces a cross ply 23 which itself has a uniform thickness. Therefore, one of ordinary skill in the art would not have had a reason to transfer the sheet of AAPA in a third direction orthogonal to the first direction based on the van den Akker reference in order to produce a laminated structure having a uniform thickness, as suggested by the Examiner.

Further, with regard to the Examiner's assertion that van den Akker provides a reasoning for the transferring of the first sheet in the third direction based on the strength of the laminated structure, it is noted that van den Akker discloses that the complementary ends of the web parts interlock with each other to form the transverse fiber web (see Abstract), and that the transverse fiber web and the longitudinal fiber web are firmly joined to one another to form a cross ply on which tensile forces can be exerted in all directions (column 7, lines 55-57). However, as stated above, amended independent claim 1 recites that *the films are arranged to be peeled off from the first sheet*. Thus, van den Akker teaches away from the films being arranged to be peeled off from the first sheet by disclosing a cross ply which as able to withstand tensile forces in all directions, and therefore one of ordinary skill in the art would not have had a reason to transfer the sheet of AAPA in a third direction orthogonal to the first direction based on the van den Akker reference.

Tsujimoto discloses a method for producing a laminated composite which, as shown in Fig. 22, includes a longitudinal sheet S1 which is bonded to a core material C by thermocompression bonding to form an intermediate lamination which is cut into pieces L1. The cut pieces L1 are rotated 90°, and a lateral sheet S2 is bonded to the pieces L1 to form a final lamination L2. Based on the disclosure of Tsujimoto, the Examiner concludes that it would have been obvious to one of ordinary skill in the art to modify the AAPA by utilizing the transferring

of the pieces L1 in a direction orthogonal to the first direction to obtain a circuit board having good thickness precision (col. 19, lines 22-23 and col. 37, line 34 of Tsujimoto), as stated on page 5 of the Office Action.

In this regard, it is noted that Tsujimoto does not disclose that the rotating of the pieces L1 produces a good thickness precision. Rather, column 19, lines 17-24 state that "in the present invention, the pressure is not controlled but displacement in the range of the compressive elasticity area is changed, thereby performing the above-mentioned compression. According to this method, even if the heating temperature of the thickness of the foamed body sheet changes, a laminated composite having a good thickness precision can be obtained." In addition, column 37, lines 31-36 state that "the pressing quantity is controlled by the compressive strain quantity of the foamed body sheets; therefore, even if the heating temperature changes, laminated composites having a uniform thickness can be produced." Thus, Tsujimoto clearly states that the thickness precision of the laminate structure is obtained by changing the displacement in the range of the compressive elasticity area, or by controlling the compressive strain quantity. Tsujimoto does not disclose that the rotating of the pieces L1 produces a good thickness precision, and therefore one of ordinary skill in the art would not have a reason to transfer the sheet of AAPA in a third direction orthogonal to the first direction based on Tsujimoto.

Further, it is noted that Tsujimoto is directed to a method of producing a laminated composite which is used as a civil engineering and construction material, and in particular, as a tatami mat core material for the floor of a house. The sheets S1 and S2 serve as the face material on the surface of the core material, as shown in Fig. 4. As stated in column 2, lines 50-58, the face material is composed of the longitudinal sheets S1 and the lateral sheets S2 in an orthogonal form in order to cancel anisotropy in the longitudinal and lateral directions. However, as stated above, amended independent claim 1 recites that *the films are arranged to be peeled off from the first sheet*. As described above, Tsujimoto discloses that the sheets S1 and S2 are thermocompressed onto the core material and are necessary to eliminate the anisotropy of the composite structure. Therefore, Tsujimoto teaches away from the sheets S1 and S2 being arranged to be peeled off from the core structure, and therefore one of ordinary skill in the art

would not have had a reason to transfer the sheet of AAPA in a third direction orthogonal to the first direction based on Tsujimoto.

Therefore, for the reasons presented above, it is believed apparent that the present invention as recited in amended independent claim 1 is not disclosed or suggested by the AAPA, the van den Akker reference and the Tsujimoto reference taken either individually or in combination. Accordingly, a person having ordinary skill in the art would clearly not have been motivated to modify the AAPA in view of the van den Akker reference or the Tsujimoto reference in such a manner as to result in or otherwise render obvious the present invention of independent claim 1.

Therefore, it is respectfully submitted that amended independent claim 1, as well as claims 2-6 and 10-12 which depend therefrom, are clearly allowable over the prior art of record.

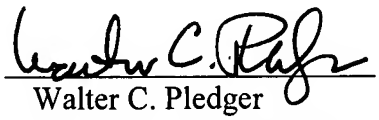
In addition, the Examiner's attention is directed to the dependent claims which further define the present invention over the prior art. For example, dependent claim 6 recites that the first sheet has a rectangular shape having a long-side direction and a short-side direction, and that the long-side direction is orthogonal to the first direction of the first sheet. In this regard, it is noted that on page 4 of the Office Action, the Examiner indicates that AAPA discloses the long-side direction as being orthogonal to the first direction, as shown in Fig. 6. However, it is noted that Fig. 6 clearly shows that the long-side direction is parallel to the first direction, and is not orthogonal to the first direction. It is also noted that none of the McMaster, van den Akker and Tsuijmoto references disclose the features of dependent claim 6.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice to that effect is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

Toshihiro NISHII et al.

By: 

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